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REPORT ON A MAGNETOMETER SURVEY
AT
BEACONSFIELD ASBESTOS PROSPECT
FOR
ALLSTATE EXPLORATION N.L.

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INTRODUCTION

A ground magnetic survey was conducted by McPhar Geophysics Pty. Ltd. in September, 1971 for Allstate Exploration N.L. over the Beaconsfield Asbestos Prospect, Tasmania. The aim of the geophysical survey was to provide additional data to help in the search for asbestos deposits. The magnetic results should provide the interpretation of magnetite zones within the serpentinite, thus allowing an assessment of probable zones for the occurrence of asbestos.

GEOLOGY

The geology of the area, as outlined to the author, is essentially an ultrabasic serpentinite complex, intruded by syenite and overlain by Tertiary gravels. The area was previously mined for its asbestos content and is currently being explored for that mineral. The serpentinite has been classified into four categories:

(a) crystalline serpentinite, resistant, dark to light green
(b) fine-grained serpentinite, granular, mid to dark green
(c) amorphous - substranslucent serpentinite, mid to dark green - common host rock for asbestos.
(d) granular fine-grained serpentinite, pale green.

SURVEY PROCEDURE

The prospect was visited by the author prior to the commencement of the survey and it was agreed that a station spacing of 25 feet on traverses spaced 200 feet apart would provide an adequate coverage of the area. The high station density was required to properly define the intense magnetic fluctuations characteristically exhibited by serpentinite intrusions. The close line spacing was necessary to allow correlation of anomalies along strike.

The results were initally presented as profiles of vertical magnetic intensity and these profiles have been distributed to Allstate Exploration N.L. For this report the profiles have been smoothed, to remove erratic fluctuations, and the results have been presented in contour form in plan Dwg: M3213A. Several areas could not be contoured where data was not recorded due to the lack of pegs in swamps and creeks.

NOTE: In the southern hemisphere, the vertical magnetic field is reversed in direction when compared with the vertical magnetic field in the northern hemisphere. As a corollary to this situation, magnetic anomalies (vertical field) in the southern hemisphere are also reversed in sign, relative to magnetic anomalies in the northern hemisphere. In order to remove the ambiguity of having negative anomalies indicating an increase in magnetite contact, we have reversed the sign of magnetic values used in the preparation of contour plan DWG: 3213A.

THEORY

To enable a full understanding of the following interpretation, a few points concerning magnetic anomalies over serpentinite bodies must be included. The magnetic anomalies are caused by the magnetite content of the rock. This magnetic content can be highly variable, and is often confined to zones caused by alteration or metamorphism of the serpentinite. High concentrations of magnetite will cause strong magnetic anomalies and low concentrations of magnetite will not produce significant anomalies, the latter case resulting in areas of low magnetic disturbance.

A property of the magnetic field will produce a polarity in the magnetite body, giving rise to strong negative magnetic anomalies in association with strong magnetic highs. It is also possible for the magnetite to take up a reversed polarity, thus creating strong negative anomalies that may not necessarily exhibit a flanking positive anomaly. Such a negative anomaly may be observed at station 17800E on line 27400N.

INTERPRETATION

The magnetic data from the Beaconsfield Asbestos Prospect showed the presence of sharp, strong variations in the local magnetic field that were superimposed on broad anomalies of slightly less intense amplitude. The strong fluctuations could be smoothed, in most of the area, to allow recognition of the broader, less intense anomalies. The reason for smoothing the data was to allow the recognition of anomalies that could be correlated from line to line as the sharp fluctuations could not be expected to form into trends over the distance of the traverse separation. The fluctuations were too severe, however, to be removed over an area from 28000N to 29200N, and from 16600E to 17600E, and no attempt has been made to contour the data inside this area. Several strong magnetic anomalies were not contoured because of steep magnetic gradients, and each of these anomalies was annotated, within the zero contour, as a "STRONG MAGNETIC HIGH".

The magnetic contour plan shows that the rock type that is favourable for occurrence of asbestos (Rock type "C") generally occurs in areas bounded by magnetic lows. This relationship would suggest that the favourable rock type has a low magnetite content.

It may therefore be possible to outline further occurrences of this rock type by following these magnetic lows. It would be necessary not to mistake the areas of low magnetic relief with negative anomalies on the flanks of strong magnetic highs.

The cause of the residual strong magnetic highs in the area is not apparent from the geology map, but these anomalies do appear, in some cases, to coincide with the syenite -

ultrabasic contact, and thus may be caused by magnetic zoning due to metamorphic effects at the contact.

It is not possible to relate the magnetic anomalies to geology on the western half of the survey area, as the geology map only covers the area from 18400E to 20000E.

CONCLUSIONS

The correlation of magnetic anomalies with geology is only possible over a small section of the surveyed area. However, this amount of information has shown that the favourable rock-type for the occurrence of asbestos is characterised by areas of low magnetic relief. It may therefore be possible to locate areas of asbestos occurrence by following the magnetic anomaly pattern. The areas of low magnetic relief must not be confused with negative magnetic anomalies that are associated with strong magnetic highs.

RECOMMENDATIONS

It is recommended that geological investigation, either by mapping or drilling, be undertaken to ascertain if the above-mentioned conclusions are true.

Areas for inital investigation would be -

(i) the low magnetic area in the vicinity of 30600N to 29800N near 16900E to 17999E,

(ii) the low magnetic area at 16800E from 26400N to 27600N,

(iii) the area of low magnetic relief at 13800E from 26400N to 27200N.

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